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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,733	02/21/2006	Stefano Barbieri	M0025.0325/P325	2090

24998 7590 06/26/2009
DICKSTEIN SHAPIRO LLP
1825 EYE STREET NW
Washington, DC 20006-5403

EXAMINER

GOLUB, MARCIA A

ART UNIT	PAPER NUMBER
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2828

MAIL DATE	DELIVERY MODE
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06/26/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/530,733	Applicant(s) BARBIERI ET AL.	
	Examiner MARCIA A. GOLUB	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 5,6,13 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claim 1 have been considered but are not persuasive.

Regarding applicant's argument that Hwang does not disclose that the emission from the laser is collected from the edge of the active region, the examiner disagrees and points out that the applicant did not define from which edge the laser is emitted, therefore the top side of the active layer can be considered to be the emitting edge.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., lower series resistance, thickness of the active layer, cleaved facets) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4 and 7-10, 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Hwang (6,560,259) hereinafter '259.

Figs. 1 and 5 of '259 disclose a laser comprising:

1. "a substrate comprising a bulk region [101, 108, 131, 502] and a conducting layer [109, 104];

an active region [105] comprising a quantum cascade structure provided on a first surface of the substrate such that said active region is electrically connected to said

conducting layer [109, 104],

the active layer having a thickness selected such that the energy spacing of sub bands formed by the layers causes the active region to lase; (Fig 2)

first and second contacts [122] provided to said conducting layer such that said first and second contacts are electrically connected to said active region, said first and second contacts being disposed on opposite sides of said active region;

and an active region contact [124, 511] provided to said active region such that a potential [510] may be applied between said active region contact and said first and second contacts to cause said active region to lase,

said active region contact being metal contact provided overlying said active region and wherein emission from said laser is collected from the edge of said active region.” (laser beam is output from the top edge/side of the active layer)

2. “wherein the conducting layer [109] comprises a highly doped semiconductor.” ($1 \times 10^{19} \text{ cm}^{-3}$)

3. “wherein the conducting layer is thin enough [20 nm], such that in operation, the two surface plasmons present at the two interfaces of the conducting layer merge into a single mode.” Structure of the device implies its function, see MPEP 2112.01.

4. “ wherein the cascade laser is configured to emit photons having a frequency in the range from 0.02 THz to 100 THz.” No actual structure is recited that would differentiate the invention from the prior art in configuring it to emit in THz range.

9. “wherein said first and second contacts [122, 511] are symmetric about said active region.

7,8. “wherein the resistance between the first and active region contacts or second and active region contacts is less than twice the resistance of the active region.” No actual structure is recited that would differentiate the invention from the prior art in making the resistance between the contacts less than twice the resistance of the active layer. Also, it is not clear at what operational voltage/current the resistance is measured.

10. “wherein the dielectric constant of the conducting layer [109] is negative relative to the dielectric constant of the surrounding layers [133].” The dielectric constant of metals and highly doped semiconductors is negative, while the dielectric constant of

insulators is positive.

12. “wherein the active region comprises a lamination of layers [InAlAs/InGaAs] having at least two different band gaps.”

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over ‘259.

Figs. 1 and 5 of ‘259 disclose a laser device as described above, in addition:

11. “wherein the active region [105] comprises a strip waveguide”
but do not disclose:
11. “a strip waveguide with a trapezoidal cross section.”

It would have been obvious to one of ordinary skill in the art to make the cross section in the shape of a trapezoid, since applicant has not disclosed that this particular shape solved any stated problems or is for any particular purpose. The selecting a shape is a matter of choice which a person of ordinary skill in the art would have found obvious, see MPEP 2144.04.

Conclusion

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Info

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARCIA A. GOLUB-MILLER whose telephone number is (571)272-8602. The examiner can normally be reached on M-Th 9:30-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marcia A. Golub-Miller/
Examiner

/Minsun Harvey/
Supervisory Patent Examiner, Art Unit 2828